A STATUS REPORT ON THE DESIGN AND IMPLEMENTATION OF STATE RENEWABLE PORTFOLIO STANDARDS AND SYSTEM BENEFITS CHARGE POLICIES

Kevin Porter
National Renewable Energy Laboratory
409 12th Street, SW, Suite 710
Washington, DC 20024-2125

Ryan Wiser
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 90-4000
Berkeley, California 94720

ABSTRACT

At last year's Windpower conference, we reported on state policies to foster renewable energy as part of efforts to restructure state electric power markets. The primary policies states are pursuing for renewables are system benefits charges (SBC) and renewable portfolio standards (RPS). Renewable portfolio standard policies began taking effect this year, while other states are continuing to work on the design of their RPS implementation strategies. In addition, states have begun distributing proceeds from their SBC funds. As a result, some renewable energy projects are beginning to materialize. This paper provides an update on state efforts with these two policies and examines some of the implementation issues and difficulties that states have faced thus far.

1. INTRODUCTION

After a whirlwind of activity, electric restructuring activities in the states are beginning to slow somewhat. Still, 24 states already have firm plans to introduce retail competition. Many of these states—16 in total—have established renewable portfolio standards (RPS) and/or system benefit charges (SBC) targeted, at least in part, towards renewable energy.[1] Wisconsin enacted both an RPS and SBC without passing electric restructuring legislation.

The RPS allows policy makers to require that a minimum percentage of a state's annual electric use come from renewable energy. To implement the policy, a renewables purchase requirement (typically as a percent of electricity sales) is imposed on retail suppliers of electric power. To add flexibility in meeting the purchase requirement, individual obligations can be tradable through a system of renewable energy credits. As Table 1 shows, the RPS has now been adopted in eight states: Connecticut, Maine, Massachusetts, Nevada, New Jersey, Pennsylvania, Texas, and Wisconsin. Credit trading is being considered in many states, but to date has only been adopted in Texas. Maine became the first state to have operating experience with the RPS when its policy took effect in March 2000. Several other states are well along in developing the implementation details of their policies.

SBCs are a way to collect funds from electric customers to support various "public benefit" policies, including renewable energy programs. SBCs are typically proposed as a volumetric fee on electric use, such as a cents per kilowatt-hour (kWh) adder imposed on all electricity users through their electric rates. Once SBC funds are collected, methods of distribution must be devised. SBCs encompassing renewables have been adopted in 13 U.S. states: California, Connecticut, Delaware, Illinois, Massachusetts, Montana, New Jersey, New Mexico,

TABLE 1. RPS POLICIES ESTABLISHED AT THE STATE LEVEL

State	Renewables Standard Level	Status As of April 2000

[1] We note that, although our focus is on state RPS and SBC policies under retail competition, other state policies are also playing significant roles in renewables development. These include policies in Iowa and Minnesota.

Connecticut	Class I or II Technologies: 5.5% in 2000, 7% in 2009; Class I Technologies: 0.5% in 2000, 6% in 2009	RPS for individual suppliers may be delayed by two years. Decision to not apply the RPS to default suppliers under appeal to state Superior Court.
Maine	30% in 2000 and thereafter	RPS took effect in March 2000.
Massachusetts	1% new renewables in 2003, 4% in 2009, and increasing 1%/year	Draft regulations due later this year. Credit trading system likely to be established.
Nevada	0.2% in 2001, 1% in 2009; 50% of standard must come from new solar	One utility may be exempted until 2005. Two major utilities have sued to overturn restructuring law.
New Jersey	Class I or II Technologies: 2.5%; Class I Technologies: 0.5% in 2001, 4% in 2012	Implementation regulations not yet determined, though draft regulations have been released.
Pennsylvania	For PECO, West Penn, and PP&L, 20% of residential customers served by competitive default provider: 2% in 2001, increasing 0.5%/yr; for GPU, 0.2% in 2001 for 20% of customers, increasing to 80% in 2004	Requirement imposed on service-territory basis. GPU's solicitation of default suppliers did not receive any bids. PECO Energy and PP&L auctions due later this year.
Texas	New and existing renewables: 1280 MW by 2003, 2880 MW by 2009 (2000 MW must come from new renewable resources)	Regulations issued in December 1999. Owners of existing renewables given pro rata exemption from RPS but cannot participate in credit trading.
Wisconsin	0.5% by 2001, increasing to 2.2% by 2011 (0.6% can come from non-hydro facilities installed before 1998).	Draft regulations sent to the Wisconsin Legislature in March 2000. Renew Wisconsin reviewing regulations under contract to the Wisconsin PSC.

TABLE 2. SBC POLICIES ESTABLISHED AT THE STATE LEVEL

State	Level of Support for Renewables	Status As of April 2000
California	$135 million/year for four years beginning in 1998	45% for existing renewables; 30% for new renewables; 10% emerging renewables; 15% green power markets.
Connecticut	Approx. $14 million/year in 2000; $30 million/year in 2004 and thereafter	First investment made in green power aggregator.
Delaware	$1.5 million per year for renewable energy and energy efficiency	Implementation efforts just getting under way.
Illinois	$5 million/year for 10 years beginning in 1999; renewable eligible for additional $250 million clean energy trust fund	Ongoing grant and rebate programs. Funds to date have gone largely for PV and solar thermal systems.
Massachusetts	Approx. $26 million/year from 1998 on	Litigation prevented fund disbursement, but favorable court decision will allow now funds to be released.
Montana	Approx. $2 million/year from 1999-2003	Utilities receive credit against SBC allocation for expenses on covered programs under the SBC; state administers remaining funds.
New Jersey	$17-$35 million/year from 2000-2008	NJ Board of Public Utilities considering two different fund proposals, with dividing issue on whether utilities should administer funds or not.
New Mexico	$4 million/year beginning in 2001	Restructuring law contemplates a revisiting of financial support for renewables.
New York	$15 million for 3 years beginning in 1999	Wind projects under development.
Oregon	$8.7 million annually for 10 years	Oregon PUC staff proposed draft rules in April 2000 for collecting SBC funds. Separately, a task force exploring program administration and implementation issues.
Pennsylvania	$11million/year fund, including renewables, until between 2004 and 2006; fund may be extended. Renewable Energy Pilot Fund raises $3.9 million/year for 2001-2002	Renewable Energy Pilot largely focused on solar. Only one utility SBC fund in operation. Merger settlement will add $20 million and result in new wind project.
Rhode Island	Approximately $2 million/year from 1998-2002. PUC can extend fund.	Has funded wind feasibility studies, and PV projects. Renewables RFP has been released.
Wisconsin	Approximately $3.6 million per year	Requirements and grant procedures to be established.

New York, Oregon, Pennsylvania, Rhode Island, and Wisconsin (see Table 2). California, Connecticut, Illinois, Montana, New York, Pennsylvania and Rhode Island have begun to distribute funds to renewables projects.

The scope, nature, and design of the RPS and SBC policies differ substantially by state, reflecting different policy objectives, renewable resource endowments, and the existing levels of renewables infrastructure. For example, the

size of the RPS varies from 1% in Nevada to 30% in Maine, whereas annual SBC funding ranges from roughly $1 million in Delaware to $135 million in California. Although some of the SBCs were designed to operate for a lengthy or indefinite period, in three states, the SBC design life is just three to five years. State RPS policies, on the other hand, have generally been designed to operate for a longer period. New wind power projects have been deemed an eligible technology in virtually every case; however, states often differ in their treatment of existing renewables, especially hydropower, municipal solid waste (MSW), and biomass.

2. A STATUS REPORT FROM THE STATES

Maine is the first state with an operating RPS, and perhaps two more—Connecticut and New Jersey—may follow this year. Already, some market impacts from these RPS policies are being witnessed. More distressing, however, is the delay in getting RPS policies implemented in states such as New Jersey and Nevada and sub-optimal RPS design features in states such as Connecticut and Maine. States also continue to distribute SBC funds, and some wind projects are under way using those expenditures. The following is a state-by-state update of RPS and SBC activity.

California: The state's $540 million SBC fund for renewables is divided into five accounts: existing renewable resources; new renewable resources; emerging renewable resources; customer credit; and consumer education. This paper will discuss all but the customer credit and the consumer education accounts. Thus far, the California Energy Commission (CEC) has awarded $90.9 million to various parties in the renewable energy SBC.

Existing Account: Payments are made monthly on a cents/kWh basis, and are paid at the lowest of three possible incentive rates: the difference between the target price and the market-clearing price; a pre-determined cents/kWh cap; or a funds-adjusted price determined by dividing the monthly existing renewable generation submitted into available funds, and then accounting for the differences in the short-run avoided cost price among the three investor-owned utilities in California. The target price for wind power is 3.5 cents/kWh, with a cap of 1 cent/kWh. Wind is eligible for $70.2 million of the $243 million available in this account. Suppliers have to register with the CEC to be eligible, and show that their facility is located within the state and was operational before September 26, 1996. So far, 239 facilities have registered, representing more than 3800 MW of capacity. Wind accounts for 74 of these facilities, representing 1,374 MW.

New Account: A renewable energy facility is considered new if it is first operational after September 26, 1996. The CEC sponsored an auction in June 1998 for renewable energy developers to bid for a five-year incentive of as much as 1.5 cents/kWh. Bids were accepted in order from lowest to highest until all the funds were allocated. The CEC selected 55 bids for 552 MW, as indicated below. Wind did well in the CEC auction, garnering more than 300 of the 550 MW in winning projects. Nine renewable energy projects have come on-line, all but two of these landfill gas. The other two are wind projects. The CEC estimates that 13 projects will come on-line in 2000 and another 29 in 2001. Of these, two wind projects are expected to become operational in 2000 and 19 in 2001. Two winning bidders have already cancelled their project plans.

Emerging Account: The aim of this account is to provide a multi year series of payments, declining over time, to buyers, sellers, lessors or lessees of small wind systems, photovoltaics, solar thermal electric technologies, and fuel cell technologies that use renewable fuels. At least 60% of the $54 million is reserved for systems of 10 kW or less, and another 15% in each annual funding block is reserved for systems rated at 100 kW or less. The eligible systems must also be on a list of CEC-certified equipment. As of the end of 1999, the CEC made $3.46 million in payments for 239 systems. The vast majority of these were photovoltaic systems (222); however, 15 wind systems and 2 fuel cell systems also received funding, for a total of 1.24 MW. The CEC has approved another 171 systems, in various stages of development and construction, for a total of 1.44 MW.

Connecticut: The RPS in Connecticut has had a stormy implementation period. The Connecticut Department of Public Utility Control (DPUC) issued regulations in 1999 stipulating that the RPS be based on capacity rather than energy. Upon legislative review, the RPS was changed back to an energy-based standard; however, energy retailers could request a two-year delay in meeting the RPS. Only one supplier has applied for a waiver, and the DPUC denied their application. Later, based on their interpretation of the RPS legislation, the

DPUC voted to exempt default-service providers from the RPS, a ruling the Connecticut Consumer Counsel is appealing to the state Superior Court. Because the majority of consumers are not expected to switch electric providers in the early years of electric competition, exempting default providers may wall off most of the retail market in Connecticut, and acts as a large entry barrier for retail electric suppliers in Connecticut. In sum, without changes, the Connecticut RPS looks like it will be more ineffectual than many had hoped.

Connecticut Innovations is responsible for implementing the renewables portion of the state's SBC. It assumed control over the fund at the beginning of this year. The fund managers plan to treat the fund as a venture capital investment fund, and will make higher-risk investments in businesses and projects focused on sustainable energy, with a corresponding expectation of higher-than-normal returns. Promotion of clean energy technology as an important near-term contributor to the economy and energy markets of Connecticut is a prime objective of the fund. Lower priority will be given to projects or proposals that are focused on R&D, demonstrations, market assessments, or other efforts that do not contribute directly to the economy of Connecticut. Although these projects will be considered, it will be primarily for their direct contribution to the expected commercialization of the product or technology involved. In March 2000, the first investment closed, for $500,000, to the Connecticut Energy Co-op, an energy provider to residential and small commercial customers, as well as a green power aggregator that will support the installation of home PV or wind systems.

Delaware: An annual environmental incentive fund of $1.5 million was created for renewable energy and energy efficiency. The Delaware Development Office oversees the fund with the Division of Public Advocate and the Energy Office; however, a decision on how to spend the fund has yet to be made.

Illinois: There are two SBC funds in Illinois. The 1997 restructuring legislation created a $5 million annual renewable energy fund for the next 10 years that is administered by the Illinois Department of Commerce and Community Affairs. The state agency released funding guidelines in 1998 and updated them in 1999. The fund is structured as a grant, rebate, and loan program for new wind, solar, biomass, and hydro projects that will cover 60% of the costs of new projects up to $300,000, or 50% up to $150,000 for solar thermal facilities. In 1999, Illinois funded 11 PV systems with an aggregate capacity of 54 kW; a 29-kW PV rooftop system; a 3-MW landfill gas project; and the modification of three older solar thermal systems and two hydro projects.

A second SBC was created as part of a settlement with Commonwealth Edison in 1999. The $250 million fund encompasses renewable energy, energy efficiency, clean coal, wildlife preservation and support for the Illinois Citizens Utility Board. Solar, wind, and biomass are the eligible renewable energy technologies. PV manufacturer Spire Corporation plans to build a photovoltaics manufacturing plant on a redeveloped brownfield site in Chicago, relying in part on funds from this source.

Maine: The RPS in Maine took effect when the retail electric market opened in March 2000. Because the market just opened, data on RPS compliance is sketchy at best. So far, 13 retail suppliers have registered in Maine and will have to comply with the RPS, and a green power supplier—Energy Atlantic—recently began operations. The Maine Public Utility Commission has been issuing licenses to retail suppliers even if their RPS compliance plans are somewhat uncertain, out of recognition that these suppliers may not know how much electric load they will be serving and therefore cannot estimate their RPS obligations with precision. Maine does give retail suppliers considerable flexibility in meeting their RPS requirements, such as averaging RPS obligations over two compliance periods. Retail suppliers also have a glut of renewable energy supply options to choose from. Maine's 30% RPS is less than the 45–50% the state was already receiving from renewable energy, and the eligibility of high-efficiency cogeneration adds to the oversupply of eligible resources. Still, the 30% RPS level may be an initial shock to some potential new entrants. In 1999, for example, citing overly high prices, the Maine PUC rejected one-year bids to supply default power service to customers of Bangor Hydro-Electric, or to Central Maine Power's commercial and industrial customers. There is some belief that the RPS may have been a contributing factor, although the tight wholesale power market may also have played a part. That said, anecdotal evidence suggests that RPS compliance costs are modest, with eligible resources running at an 0.1-0.15 cents/kWh premium over conventional resources. At this incentive level, it appears unlikely that Maine's RPS will do much to increase renewable generation in the state, or even stem the likely decline in existing renewable energy capacity.

Massachusetts: The Massachusetts SBC starts at about $40 million per year for the first five years, with roughly 25% of that reserved for pollution controls for existing waste-to-energy plants, or the retirement of those plants, in those first five years. After that, the SBC fund for renewables is about $26 million per year. The Massachusetts SBC was challenged in court in March 1998 as unfairly discriminatory because municipal electric utilities do not collect the charge. No SBC funds were expended, pending a court decision. In April 2000, the Massachusetts Supreme Judicial Court upheld the statute creating the SBC, thereby freeing roughly $75 million in funds that had been collected to date for renewable energy technologies.

The Massachusetts Division of Energy Resources (DOER) is moving forward with RPS implementation. The DOER has commissioned a number of white papers on various implementation topics, and has convened a monthly advisory meeting of interested stakeholders. A comprehensive RPS design proposal is expected by summer 2000, and draft regulations will follow after that. So far, it appears there is wide support for some type of credit trading system that will require legislative approval. The group is wrestling with whether to have a RPS for existing renewables, as well as a RPS for new renewables, given the present glut of existing renewables in New England. There also is consideration being given to a proposal to not only set a penalty for RPS non compliance, but also to require that non compliant retail suppliers make up the shortfall of renewable energy during the compliance period.

Montana: The 1995 restructuring law created a SBC encompassing 2.4% of retail sales. The SBC generates about $14 million annually until its scheduled expiration in 2003, with about $2 million per year for renewable energy technologies. Large customers with loads of more than 1 MW must dedicate 0.9 mills/kWh, or $500,000, minus any amount they spend directly on energy efficiency or renewable energy. Final regulations were approved in 1999, and those regulations place the funds with electric utilities, although any funds the utilities do not spend are administered by the state. Montana Power—the largest holder of SBC funds at about $8 million annually—has been the most aggressive. The utility funded residential renewable energy projects and released a RFP for a wind project. Montana Dakota Utilities is also working on establishing a SBC program.

Nevada: Nevada's RPS is relatively small compared to those of other states, starting at 0.2% in 2001 and gradually increasing to 1% by 2009. Half of the RPS is reserved for solar electric and solar thermal technologies. All other renewable energy technologies (including solar) are eligible for the other half. Although one of the first states to approve an RPS policy, Nevada has yet to fully implement its RPS. The state has twice delayed the start of retail competition, the second time indefinitely while the governor tried unsuccessfully to fashion a comprehensive implementation plan with stakeholders. In addition, Sierra Pacific and Nevada Power, the two major utilities in the state, merged and decided to divest their generating assets. More recently, Sierra Pacific has decided not to be a provider of last resort, and both Sierra Pacific and Nevada Power sued to overturn the state electric restructuring law over unfavorable rate decisions issued by the Nevada Public Service Commission.

Of the RPS, implementation has been hampered based on the eligibility of Nevada's 160 MW of geothermal plants. Most of the geothermal projects were undertaken to comply with an earlier state law, and the state restructuring law recognized Sierra Pacific's efforts by exempting the utility from the RPS until 2005, and then setting up a solar-only RPS for that utility. The utility merger raises the question of whether the Sierra Pacific part of the utility receives the exemption, or whether the entire merged utility receives the exemption. Of even greater importance is the question of whether the RPS applies to the existing geothermal facilities or not. Backers of the RPS assert that the RPS applies only to new renewable energy projects, and a legislative drafting error is to blame. If the geothermal projects are eligible, those projects will more than satisfy the renewables part of the Nevada RPS, and the RPS effectively decreases to ½% solar requirement.

New Jersey: New Jersey also has both an RPS and an SBC. The New Jersey RPS encompasses two tiers. The RPS is first set at 2.5%, and all renewable energy technologies are eligible. A second tier for solar, wind, fuel cells, geothermal, landfill gas, tidal or wave energy, and "sustainable" biomass begins at 0.5% in 2001 and gradually increases to 4% by 2012. The New Jersey Board of Public Utilities (BPU) has issued 18-month interim regulations for all its restructuring orders, recognizing that open electric markets may be slow to emerge, and the interim status will give the BPU more time to fully address issues in a more timely and comprehensive

manner. Yet the BPU, as of this writing, has yet to issue interim RPS regulations, although they have planned to do so for months. Implementation issues include how to define sustainable biomass, eligible MSW and hydro facilities. The BPU issued a draft RPS rule classifying eligible hydro as facilities under 30 MW, and eligible MSW facilities as those that have air permits from the New Jersey Department of Environmental Protection (DEP). The draft rule did not attempt to define sustainable biomass. This issue may get postponed for consideration in a final rule. Once the interim rule is released, the BPU and DEP will begin considering whether to adopt renewable energy credit trading in a final rule.

The New Jersey SBC will include about $265 million for renewable energy from 2000–2008. Annual funding amounts will vary from about $17.5 million in the first year to $32-35 million between 2004 and 2008. Wind, photovoltaics, and fuel cells are the technologies initially eligible for the SBC; however, the BPU can add additional Class I renewable energy technologies as desired. Although the SBC was supposed to begin this year, the BPU has not yet issued a final rule. Two competing proposals are vying for BPU approval. The Natural Resources Defense Council, Environmental Defense, 6 of the 7 state's electric utilities, and several renewable energy industry groups are backing a $423 million fund for energy efficiency, low-income customer assistance, and renewable energy. For renewables, the fund would focus on solar, small wind power systems, and fuel cells. A second proposal by the New Jersey Division of Ratepayer Advocates and several other public interest groups would create a $512 million that would be administered by an independent entity. The fund would include $32 million annually for renewables, and be divided into an emerging-technologies green market fund (40%); a buy-down program (40%); economic development and R&D (15%); and training and public education (5%).

New Mexico: The New Mexico SBC includes $4 million annually for renewable energy; and a smaller amount is reserved for Indian tribes that wish to use renewable energy technologies. Unlike other states, the New Mexico SBC does not have an expiration date, although SBC support for renewable energy may be revisited at some point, according to the restructuring law. Solar, wind, hydro, geothermal, landfill gas, anaerobic digesters, and biomass-based fuel cells are the eligible renewable energy technologies. Interestingly, funding recipients are limited to school districts and the governing entities of cities, towns, villages or counties. The New Mexico Department of Environment is just beginning to consider implementation rules for the SBC.

New York: New York is one of the few states that is undergoing electricity restructuring on a regulatory basis, rather than by enacting legislation. The New York Public Service Commission (NYPSC) approved comprehensive restructuring settlements with the state's seven investor-owned utilities. As part of that process, the NYPSC approved a $234 million statewide SBC in 1998 to be jointly administered by the New York State Energy Research and Development Authority (NYSERDA) and electric utilities. Of that $234 million, $15 million has been designated for renewable energy technologies.

NYSERDA set goals of using technology-specific solicitations in wind, PV, and biomass to support a minimum of 4 MW of wind power plants; 500 kW of PV; and plant 800 acres of willow trees for biomass power. The renewable energy facilities must be located in-state, and co-funding of 50% or more is required. To date, three wind projects totaling 27 MW are under way, with the Madison project expected to be on-line later in 2000. (Niagara Mohawk is sponsoring a separate 6 MW wind project with its own SBC funds). Recently, NYSERDA released a $1.3 million RFP for "high-value" wind and PV projects. NYSERDA defines high-value as "where the intrinsic benefits of photovoltaic and/or wind power generation systems justify their installation over other energy sources," such as where grid electricity is limited or unavailable. A wind resource prospecting RFP will be released this spring, intended to identify and characterize promising sites for potential wind development. NYSERA also is planning to install between 250 and 300 PV systems using SBC funds.

Oregon: Beginning in October 2001, the Oregon SBC would collect 3% of revenues from all retail electric customers, estimated to be about $50 million collected by investor-owned utilities. Renewables will receive just more than 17% or about $8.7 million annually for 10 years. Large customers with electric loads of more than 1 MW may invest the renewable energy and energy efficiency portion of their public purpose charges after certification by the Oregon Office of Energy. Eligible renewable energy technologies include wind, waste, solar, geothermal, landfill gas, digester gas, energy crops, low-emission biomass based on solid organic fuels, and hydro facilities outside protected federal areas. The Oregon PUC staff released proposed draft rules in April

2000. Separately, a task force of state agencies and interested stakeholders is meeting to consider program administration and implementation issues for the energy efficiency and renewable energy portions of the fund, and recommendations will be submitted to the Oregon PUC by summer or fall 2000.

Pennsylvania: Another state with both a RPS and SBC, Pennsylvania is unique in that both policies are imposed on a utility-by-utility basis, and differ by each utility service territory. The SBC consists of a $55 million sustainable energy fund that is funded by a 0.01 cent/kWh charge for PECO Energy, Metropolitan Edison and Penelec (both subsidiaries of GPU), Allegheny Power, and Pennsylvania Power & Light (PP&L). Depending on the utility, the 0.01 cent/kWh charge is in place until between 2004 and 2006, and continues after expiration until challenged or changed in the next utility rate case. The fund includes energy efficiency and sustainable energy economic development as well as renewable energy technologies. The PECO Energy fund is the only one in operation and has invested in the Energy Unlimited wind project. About $20 million may be added to the fund if PECO Energy's merger with Unicom is finalized, the result of a merger agreement with environmental intervenors. Of that, $15 million would be set aside for wind and would result in an expansion of the Energy Unlimited project and a separate 30 MW wind project. The Pennsylvania PUC is considering proposals to combine the other three utility SBC funds under a single program administrator. Separately, a two-year, $3.9 million renewable energy pilot program was created, with essentially all of it dedicated to photovoltaic and solar hot water systems, although small wind systems are an eligible technology in Allegheny Power's program.

Except for GPU, these same utilities must assign 20% of their remaining customers to a competitive default supplier by January 2001, and 2% of the energy to serve those customers must come from renewable resources, increasing by ½% annually. GPU's RPS level is 0.2% in 2001 for assigning 20% of its remaining customers to default suppliers. In December 1999, GPU attempted to auction 20% of its retail customers, in all customer service classes, to retail suppliers for one year. Not a single company submitted a bid. Some of the possible reasons include the small number of customer accounts put out for bid; the short term of service; uncertainty of customer demand because customers can switch back and forth between default and competitive suppliers; and a tight wholesale power market that could make it difficult for retail suppliers to bid below the GPU shopping credit of about 4.5 cents/kWh. GPU's auction may be a troubling harbinger for future auctions by PECO Energy and PP&L for default power service.

Rhode Island: The nation's first state electric restructuring law was passed in this state, with an SBC fund of about $2 million for renewable energy technologies. So far, SBC funding for renewable energy technologies has been expended on small PV systems, fuel cells, expanding an existing landfill gas project, and seeking sites for a wind project. Owners of the two best wind sites have been unwilling to commit the sites for the length of time needed for a viable wind project. If a viable site cannot be found, then efforts to develop a wind project may terminate, and a report on wind measurements and monitoring will be published. An RFP for renewable energy projects was issued and is available through September 2000.

Texas: The RPS in Texas calls for 2,880 MW of renewable energy by 2009, with 2,000 MW of that to be new installations. The Texas PUC enacted final regulations in December 1999. To take advantage of the PTC, the renewable energy credit (REC) trading program will begin in 2002, and continue through 2019. A capacity conversion factor will be used to convert the capacity targets into MWh requirements for each competitive retailer. The beginning capacity factor will be 35%; after two years, the RPS program administrator will base the conversion factor on actual capacity factors of new renewable energy facilities. Competitive retailers can bank their RECs for as many as three years. In addition, deficit banking of as much as 5% is allowed in the first two years. Finally, retailers that do not have sufficient RECs may be levied a penalty of $50 per MWh or 200% of the cost of RECs with substantive documentation.

A continuing controversy throughout the rulemaking process was determining the eligibility of existing renewable energy facilities, mostly hydro facilities owned by municipal utilities and rural cooperatives. A compromise was reached, which allowed existing facilities installed before September 1999 to generate offsets that would reduce a competitive retailer's allocated share of the RPS requirement. The offsets cannot be traded and can only be used by the retailer that owns or contracts for the renewable energy plant.

Although the RPS does not take effect for two more years, two Texas utilities have already released renewable energy RFPs. Southwestern Public Service is asking for 123,560 megawatt-hours (MWh) of renewable energy beginning in 2004, rising to 184,267 MWh in 2006 and 252,025 MWh in 2008. Texas Utilities' RFP is requesting 500,000 MWh of renewable energy. In addition, the Electric Reliability Council of Texas has received 15 interconnection requests for 2,650 MW of renewable energy projects by 2002. While not all projects are likely to be developed, the amount of MW illustrates the strong market interest in Texas. Finally, New York credit trading houses are reportedly expressing interest in the Texas RECs, and are offering 0.2-0.8 cents/kWh.

Wisconsin: Wisconsin is the only state to enact a RPS and a SBC without opening its electric market to competition. The RPS begins at 0.5% by the end of 2001 and increases to 2.2% by the end of 2011, 0.6% of which can come from non-hydro energy facilities installed before 1998. The RPS was approved as part of 1999-2001 state budget appropriations, and as such, the Wisconsin Public Service Commission was required to submit emergency RPS rules to the state legislature in March 2000.

The Wisconsin SBC sets aside about $3.5 million per year for renewable energy technologies out of the $80 million fund. The Wisconsin Department of Administration plans to select a non-profit administrator or administrators to implement the program. Proposals for grants to renewable energy projects will probably be solicited. Eligible technologies include solar thermal, photovoltaics, wind, geothermal, biomass, fuel cells powered by renewables, and hydro under 60 MW. A sunset review is scheduled for between 2004 and 2005.

3. MARKET IMPACTS TO DATE FROM STATE RPS AND SBC POLICIES

Now that states are beginning to implement their RPS and SBC policies, what has been the market impact so far for renewable energy technologies? Table 3 represents our rough estimate of new renewable energy plants, either planned or operating, from state RPS and SBC policies.

The market impact may seem disappointingly low, especially considering that the wind industry installed roughly 1,000 MW of new wind capacity last year to take advantage of the PTC before it expired in June 2000 (it, of course, has since been renewed through 2001). However, these numbers by no means illustrate the potential impact. Market activity in Texas is just beginning to stir, with the RPS there taking effect in 2002. Other state RPS and SBC policies are just getting underway, and market activity can be expected in some of those states.

TABLE 3. NEW RENEWABLES FROM STATE RPS AND SBC POLICIES

State	MW of Renewables	Technologies	Status
California	About 555 MW from new and emerging accounts	Wind, landfill gas, hydro, geothermal, biomass, PV	Most projects still in planning and development stage.
Texas	About 250 MW of renewables out to bid so far	Not specified, but wind should do well	Much more to come
New York	~ 30 MW	Mostly wind, with some PV	Wind prospecting RFP may stimulate new opportunities
Pennsylvania	~ 30 MW	Wind and PV	New wind project expected from PECO merger with Unicom
Illinois	~ 3 MW	Landfill gas and PV	$250 million fund should add to this
Montana	< 1 MW	PV	Wind RFP released in 2000
Rhode Island	< 1 MW	PV	Renewables RFP may help
Total (to date)	~ 865 MW	Wind likely to account for well over 50%	Depends on policy design

4. PRELIMINARY OBSERVATIONS

As the previous section illustrates, there is considerable state RPS and SBC implementation activity. Although it is premature to definitively report empirical evidence of the successes and failures of individual state policies, there has been sufficient activity to glean a few trends. Already, there are success stories to report. The Texas RPS will create significant new markets for renewable energy because of an RPS that is explicitly designed to

support new renewables; a well-designed credit trading system; a significant penalty to ensure RPS compliance; and some flexibility in the early years to encourage compliance and to take advantage of other policy measures such as the PTC for wind. SBC programs in California and New York are also creating new markets for renewable energy technologies, at modest market premiums of 1-1.5 cents/kWh.

Yet already there are also some policy failures to report. The Connecticut RPS is not likely to create significant new markets for renewable energy unless the state Superior Court overturns the state utility commission's recommendation that the RPS does not apply to default service providers. Existing renewable energy supply overwhelms the RPS level in Maine. Uncertainty over the eligibility of existing geothermal plants may reduce the RPS to a ½% solar standard. Administrative and implementation delays plague RPS and SBC implementation in New Jersey, and SBC implementation in Pennsylvania, and the Rhode Island SBC is having difficulty in finding renewable energy projects to support. What makes the difference between a successful and unsuccessful RPS or SBC policy? A few key policy design and implementation issues are highlighted below.

- ***Credit Trading:*** A hallmark of the RPS concept first proposed by AWEA is the trading of renewable energy credits. The RECs act as confirmation of retail suppliers meeting RPS targets, as well as indicate the costs of RPS compliance, and incorporate market forces by rewarding those renewable energy suppliers that can offer RECs at the lowest possible cost. Texas became the first state to formally adopt REC trading, and it is in the process of selecting a REC administrator. Other states that may adopt REC trading include Connecticut, Massachusetts, Nevada, and New Jersey and Wisconsin. Maine, however, did not adopt credit trading, citing concerns regarding administrative cost, policy coordination with environmental disclosure and the possible double-counting of renewable energy attributes. Other states may also decide not to adopt REC trading for these reasons. REC trading lends itself to economies of scale—a regional or national REC system may make more sense than a single-state REC, depending on the state. The size of the RPS also is a factor: Nevada's 1% RPS, for example, may be too small for a REC system.

- ***Penalties:*** A strong penalty measure is critical to ensure compliance with the RPS. The Texas RPS has the best penalty mechanism so far at the lesser of $50/MWh or twice the average market value of credits. However, penalty mechanisms in other states are either too lenient or too vague. The penalty in Maine is equal to the cost of compliance, and retail suppliers can opt out of RPS compliance by paying into a renewable energy R&D fund. Wisconsin requires court action for a penalty of $50,000 to $500,000 to be imposed. For a large utility, paying the penalty in Wisconsin may be more economical than complying with the RPS. Nevada's penalty of license revocation for RPS non-compliance is probably too extreme, but no other penalty measure has been proposed as of yet.

- ***Policy Coordination:*** States that have implemented their RPS policies have sometimes found that RPS policies may conflict with other policies such as environmental disclosure and generation portfolio standards (GPS). Possible issues include multiple credit trading systems for an RPS and a GPS; whether a RPS and GPS requirement is placed on retail suppliers (as is the case with the RPS) or generators (as with the GPS); how environmental disclosure treats out-of-state energy supply and the interaction with RPS compliance; whether RECs are recognized by state environmental disclosure policies; and differences in technology eligibility among different state RPS policies, and how that is tracked by a regional independent system operator or credit trading organization. These issues can be particularly acute in the Northeast, where states may have all three policies (disclosure, GPS, and RPS). In these states, RPS implementation was undertaken after the other two policies were implemented, making RPS implementation more complicated. In other states such as Texas, RPS implementation was accomplished before environmental disclosure. A regional environmental certificates trading program, as envisioned in the western United States, may ease some of the coordination problems.

- ***Political Volatility:*** Passing a policy to support the above-market costs of renewable energy through an RPS or SBC can be very difficult, as it seemingly runs counter to the basic thrust of opening retail electric markets to competition. Even if a RPS or SBC for renewables is enacted, though, controversy can still prevent the policy from being fully implemented. Connecticut's RPS is now in the Connecticut Superior Court, after the Connecticut Department of Public Utility Control ruled that the RPS does not apply to default service suppliers. Nevada's RPS is in limbo, after a governor-led task force failed to work out implementation

schedules and guidelines for electric restructuring, and the two major investor-owned utilities in the state sued to overturn the state electric restructuring law. SBC policies in California, Montana, and New York—in place for only three-to-five-years—will expire soon, unless legislation introduced in each state is passed to extend the SBC. The short time frame of these SBC policies makes it difficult to transform markets for renewable energy technologies in those states.

In summary, the pace of state electric restructuring slowed somewhat during 1999; however, activities abound in the design and implementation of state RPS and SBC policies. These policy design details will be critical in determining whether state RPS and SBC policies ultimately create viable markets for renewable energy. With Congress unlikely to consider national electric restructuring legislation any time soon, these state policies will provide the near-term market opportunities for renewable energy technologies. We therefore urge renewable energy companies and advocates to remain involved not only in establishing state renewable energy legislation, but also in the subsequent detailed design and implementation phases of the policy process.

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